

# Complete heart block in mumps myocarditis

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**SUMMARY** A patient with mumps myocarditis is reported. The onset of mumps was typical, with fever and parotid swelling followed by raised virus antibody titres. Atrioventricular block occurred and persisted despite steroid treatment for two weeks. He had an Adams-Stokes attack. A permanent pacemaker was implanted and, thereafter, the patient remained dependent upon it. The published material on conduction disturbance in mumps myocarditis is reviewed.

Mumps commonly affects the testes and the pancreas as well as the salivary glands but myocarditis, first suggested as a complication by Pujol<sup>1</sup> in 1918, has been thought to be rare. It is now known, however, that myocarditis is not uncommon, the incidence varying from 4 to 15 per cent of all cases of mumps.<sup>2-4</sup> We report a case of mumps myocarditis with complete heart block successfully treated by pacing.

## Case report

A 32-year-old man was admitted to the Cardiology Department of Wakayama Medical College. On 5 August 1979 he had had a pyrexia of 38.5°C and swelling of both parotid glands and had complained of dizziness. His two sons had had fever and swelling of the parotids about two weeks before the onset of his own illness. On 20 August he complained of general fatigue and on 30 August experienced dizziness. The latter was aggravated by awkward body movements. On the following day, when examined, his electrocardiogram was found to be abnormal and admission to hospital was arranged on 1 September. He was found to have a regular bradycardia of 40 per minute. His temperature was 36.5°C and blood pressure 108/70 mmHg. There was no swelling of the parotid glands. Relative cardiac dullness was normal and there were no cardiac murmurs. Examination of all other systems, including the testes, disclosed no abnormalities. The haematocrit, white blood cell count, sedimentation rate, blood urea nitrogen, serum electrolytes, and transaminases were all within the normal range. There was no rise in amylase in the urine and serum and a test for C reactive protein was negative.

Serum mumps complement fixation titre was 1:64 on admission and decreased to 1:32 during the second week and to 1:4 during the sixth week, as shown in the Table. This more than fourfold change in titres suggested a recent infection with mumps virus. There was no rise in ASO titre or antibody titres for other viruses. A chest x-ray film was within normal limits. An echocardiogram showed no pericardial effusion and normal left ventricular function. The electrocardiogram showed complete atrioventricular block on admission (Fig. 1) but two days later only first degree block. However, on the fifth day, complete heart block reappeared and ventricular standstill lasting 10 seconds or longer was found on the electrocardiogram (Fig. 2). The patient complained of dizziness. A temporary pacing electrode was inserted into the heart, and the pacing rate was set at 50 a minute. He was also treated with steroids. On the eighth day, during defecation, an Adams-Stokes attack occurred as a result of displacement of the pacing catheter, which was repositioned. At a pacing rate of 50 beats a minute no spontaneous rhythm was seen for two weeks. A permanent demand pacemaker was therefore im-

Table Virus antibody titres; complement fixation test

Viruses	1 Sept	17 Sept	1 Oct	12 Oct
Mumps	64	32	8	<4
Coxsackie A9	32	16	32	16
B1	8	<4	16	8
B3	16	8	16	16
Adenovirus	<4	<4		<4
Polio 1	<4	<4		<4
2	8	8		<4
3	<4	<4		<4
Echo 1	16	<8		<8
2	<8	<8		<8
3	<8	<8		<8

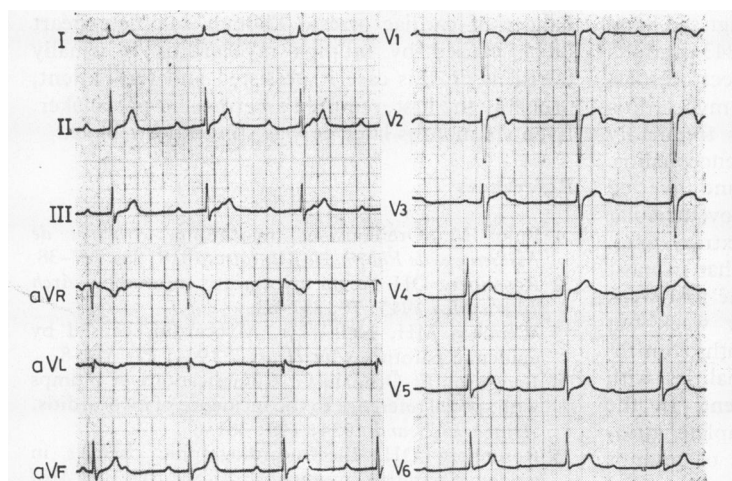


Fig. 1 *Electrocardiogram on admission (complete atrioventricular block).*

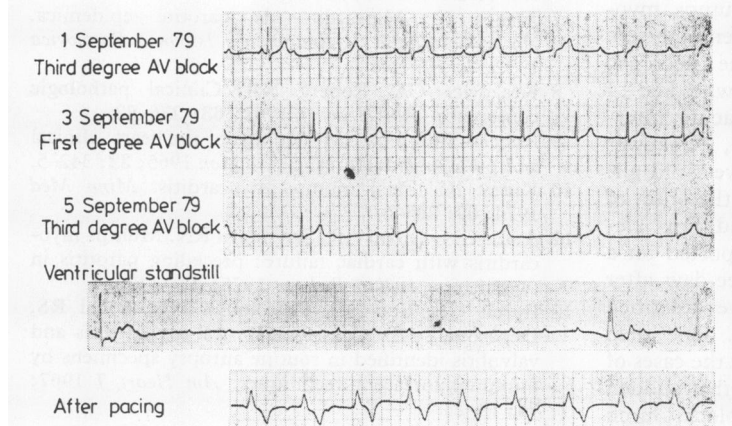


Fig. 2 *Changes in atrioventricular block after admission.*

planted on 22 September. The patient remained well for the next six months, but he was still being paced all the time in February 1980.

## Discussion

Mumps is an acute systemic disease of specific viral aetiology and its predilection for the salivary glands, testes, pancreas, and central nervous system is well recognised. In 1918, Pujol<sup>1</sup> first suggested that myocarditis might be a complication of mumps. He reported three cases with clinical evidence of myocardial involvement. In 1945, Rosenberg<sup>2</sup> first described the electrocardiographic abnormalities in a patient who developed complete heart block while convalescing from epidemic parotitis. Two years later, Rosenberg<sup>2</sup> also described a case which at first

showed incomplete atrioventricular block, later complete heart block; the rhythm returned to normal on the 77th day after the onset of symptoms. After these two cases, Rosenberg<sup>2</sup> studied 104 adult cases with mumps and found 16 cases (15.4%) with electrocardiographic abnormalities. These were mainly in the ST segments and T waves. Myocarditis commonly occurred between the fifth and tenth day after the onset of mumps and electrocardiographic changes usually disappeared within between two and 35 days but in two cases did not do so for three to five months. Cardiac symptoms, such as praecordial pain, dyspnoea, and palpitation were noted in four of the 16 patients. In 1944, Wendkos and Noll<sup>3</sup> observed that one of 15 soldiers suffering from mumps showed sinus bradycardia, flat T waves, and first degree atrioventricular block with a

PR interval of 0.34. In 1954, Bengtsson and Örndahl<sup>4</sup> studied 564 cases of mumps (243 in adults and 321 in children), and reported electrocardiographic changes in 25 of them (4.4%); myocarditis was more common in adults and was frequently found in patients with mumps meningoencephalitis. Of 25 cases, 20 showed ST depression and inverted or flat T waves. Two patients had atrioventricular block and one had multifocal extrasystoles. Bengtsson and Örndahl also showed that in most cases these changes appeared during the first week and usually regressed after a further week but persisted in some cases for several months. Smith<sup>6</sup> also reported that conduction abnormalities with viral myocarditis were usually transient. In the present case, the patient showed complete atrioventricular block, a rare complication of mumps myocarditis, which persisted for about six months and did not revert to normal.

Thus mumps myocarditis is a transient, benign and not uncommon disease. Fatal mumps myocarditis is rare, only five cases having been reported. In 1932, Manca<sup>7</sup> first described the necropsy findings in a case, a 21-year-old soldier who died 14 days after the onset of illness. He found acute, interstitial, fibrinous myocarditis. In 1962, Krakower and Roberg<sup>8</sup> reported the case of a 4-year-old girl who died of heart failure 55 days after the onset of illness, and, subsequently, Roberts and Fox<sup>9</sup> described another such case. Kussy<sup>10</sup> reported on a 9-year-old boy, who died suddenly three days after falling ill. Recently, Aram *et al.*<sup>11</sup> have described two sisters with mumps myocarditis. One died suddenly on the 50th day in hospital. In the cases of both Kussy and Aram, it seems likely that sudden death could have been caused by heart block. Burch *et al.*<sup>12</sup> described conduction abnormalities which might have been caused by focal lesions involving the conduction system.

Our patient had Adams-Stokes attacks caused by complete atrioventricular block and he was in

danger of cardiac arrest. Though complete heart block caused by mumps myocarditis is usually transient, in this case it persisted and the patient, probably the first, required a permanent pacemaker. Even six months later he was still in heart block.

## References

- 1 Pujol M. Oreillons et myocardite. *Archives de Médecine et de Pharmacie Militaires* 1918; **69**: 527-38.
- 2 Rosenberg DH. Acute myocarditis in mumps. *Arch Intern Med* 1945; **76**: 257-63.
- 3 Wendkos MH, Noll J Jr. Myocarditis caused by epidemic parotitis. *Am Heart J* 1944; **27**: 414-8.
- 4 Bengtsson E, Örndahl G. Complications of mumps with special reference to the incidence of myocarditis. *Acta Med Scand* 1954; **149**: 381-8.
- 5 Rosenberg DH. Electrocardiographic changes in epidemic parotitis (mumps). *Proc Soc Exp Biol Med* 1945; **58**: 9-11.
- 6 Smith WG. Coxsackie B myopericarditis in adults. *Am Heart J* 1970; **80**: 34-46.
- 7 Manca C. Miocardite da parotite epidemica. *Archivio Italiano de Anatomia e Istologia Patologica* 1932; **3**: 707-17.
- 8 Krakower CA, Roberg NB. Clinical pathologic conference. *Am Heart J* 1962; **63**: 276-82.
- 9 Roberts WC, Fox SM. Mumps of the heart: clinical and pathologic features. *Circulation* 1965; **32**: 342-5.
- 10 Kussy JC. Fatal mumps myocarditis. *Minn Med* 1974; **57**: 285-6.
- 11 Aram GN, Ghani AR, Srivastava RN. Mumps myocarditis with cardiac failure: preceding parotitis in two sisters. *Indian Pediatr* 1975; **12**: 1193-4.
- 12 Burch GE, Sun SC, Colcolough HL, Sohal RS, Depasquale NP. Coxsackie B viral myocarditis and valvulitis identified in routine autopsy specimens by immunofluorescent techniques. *Am Heart J* 1967; **74**: 13-23.

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